Session2: Colliding Beam Investigations

Chair: M. Syphers, FNAL

Summary Report

Speakers:

P. Bagley	Tevatron Run II plans
T. Sen	Beam-beam studies at the Tevatron
O. Bruning	Beam-beam effects in the LHC
M. Furman	Beam-beam simulation of separated beams
V. Shiltsev	Beam-beam compensation at the Tevatron: R&D Status
V. Ptitsyn	Beam-beam studies at RHIC

Summary -- Session 2 "Colliding Beam Investigations"

TEVATRON:

Collider from now on
36 x 36 ➔ 2 "PACMAN" bunches per train
Future: 132 nsec bunch spacing (approx. 100 x 100)
➔ crossing angle required
➔ Synchro-betatron resonances
➔ "folding of $\Delta\nu(a)$ plots ➔ a worry? Chaos?

Schedule for studies:
132 nsec studies available time ~Fall '00

RHIC:

Au Operation (and "commissioning"!)
IR Corrections
IBS -- a "problem" for beam studies
STRONG-STRONG Operation

Schedule for studies:
Au-Au physics run -- ~ 25% for beam/machine studies
~July/Aug '00 -- polarization studies (protons)
could parasite…

ISSUES TO STUDY FOR LHC (AND VLHC, …):

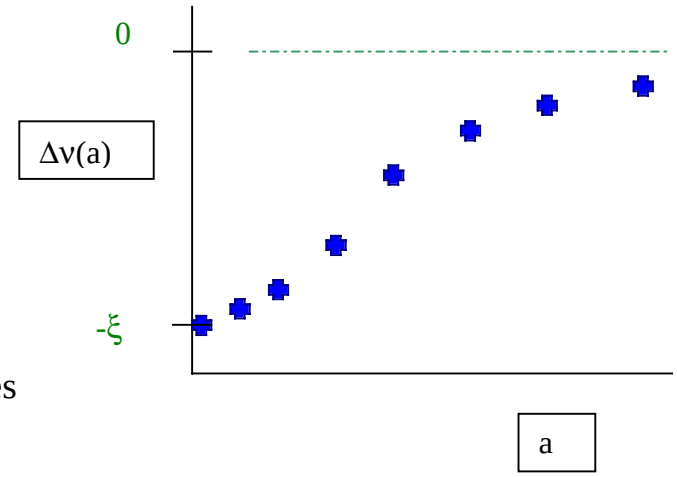
Δx^* control, IR correction, PACMAN, Dynamic Aperture vs. crossing angle,
Coherent Modes

(0.02% corrector adjustment)

POSSIBLE TOPICS FOR ORGANIZED EXPERIMENTS/STUDIES:

IR Corrections
IBS -- problem for studies, or study the problem…

Beam-beam tune footprint (HO and LR)
Beam-beam Δν(a) -- á la E-778



Crossing Angle Studies
- Lifetime
- Synchro-betatron resonances
- Dynamic Aperture

Bringing beams into collision
Coherent Beam-beam modes
- Observable?
- Feedback?

…..

WHERE DO WE GO FROM HERE?

OBJECTIVES

- → Collider Operation, tests of theory, tests of codes, …
- → LHC issues, VLHC issues, …

DETAILED PLANS

- → TOOLS: range of strengths, resolution, response functions, triggering, intensity dependent factors (thresholds), …
- → PROCEDURES: # data points, time required per measurement, transverse kicks, longitudinal kicks (s-β resonances), …
- → OBSERVABLES: resolution, errors, …
- → ANALYSIS/DIAGNOSIS: on-line analysis codes, control codes, …

PREPARATION OF THE ACCELERATOR

- → Start with optimized, "tuned-up" conditions

- → End-of-store vs**. dedicated studies**

PAC proposal(s)? ← **"motivation" required**

- → Pre-studies -- requires time in MCR **BEFORE** experiment begins

Need:

- Clear and thorough proposal
- Core group of individuals (TEV/RHIC) to drive the collaboration

Propose:

- Next "collaboration meeting":

  Present actual experimental proposals to the group for discussion/feedback.